Space Weather Forecast

Issued on Thursday, 13 January 2022 at 00:54 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/Minor Storm intervals likely, most probably day 3 (15th). Solar activity likely increasing through the period as far-side regions rotate onto Earth-side.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Very Low in the last 24 hours. There was a notable flare event on the far-side that was visible Earth-side, Whilst weak on our side, only a very limited amount of the energy of the flare was observable due to its location, and it was likely a much stronger event. This was likely connected to a sunspot region which we are expected to rotate onto the Earth-side during the next couple of days. There are six sunspot regions on the Earth-facing side. These are all generally mature and inactive, with 3 of the regions having been persistent for a number of days with no activity, or they are small and simple. Two of the regions developed in the last 24 hours, with the potential for further development.

No Earth-directed coronal mass ejections (CMEs) have been observed

Solar Wind / Geomagnetic Activity: Solar winds speeds are currently at background levels to slightly elevated, peaking around 410km/s. The total magnetic field strength carried by the wind has remained weak, with no notable strength in the important north-south direction. Geomagnetic activity was Quiet.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be Low to Very Low. There is an increasing, but still slight chance, of this becoming Moderate by day 4 (15th) as sunspot regions currently on the far side rotate onto the Earth-side.

Solar Wind / Geomagnetic Activity: There are no Earth-directed CMEs. Background solar winds are expected to persist until the arrival of the fast winds from a coronal hole. This is most likely to occur on day 3 (15th), but with a slight chance of an early arrival late 14th. Mainly Quiet geomagnetic activity expected until this arrival, becoming Active to G1/Minor Storm as it occurs, with a slight chance of G2/Moderate Storms. Declining to Quiet to Unsettled, with Active intervals and slight chance of G1/Minor Storms day 4 (16th)

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Met Office Space Weather Forecast

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	10	40	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	15	15
Very Active	R3 to R5 X	No	2	2	2	2

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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